

ABSTRACT

Disclosed herein are an ion-dissociative functional compound, a method for production thereof, an ionic conductor, and an electrochemical device, the ion-dissociative functional compound being thermally and chemically stable under the condition required of fuel cells and being suitable for use as a material such as protonic conductor in fuel cells.

The proton-dissociative functional compound shown in Fig. 1A is composed of a fullerene C_{60} molecule and about 10 sulfonic acid groups $-SO_3H$ as proton-dissociative groups each attached to the fullerene through a difluoromethane group $-CF_2-$. The proton-dissociative functional compound shown in Fig. 1B is composed of fullerene molecules three-dimensionally connected to each other through a linking group $-CF_2SO_2NHSO_2CF_2-$. It contains, as the proton-dissociative group, sulfoneimide groups $-SO_2NHSO_2-$ and sulfoneamide groups $-SO_2NH_2$ in addition to sulfonic acid groups. These compounds are prepared by introduction of difluoro(fluorosulonyl)methyl groups into fullerene molecules, and ensuing imidization and hydrolysis.